



Geant 4



Comparison of Flux Simulations for the mn000z200i Beam: MINOS, Minerva, NOvA and other topics

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Preparation

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- Gathered flux files from individual expts suggested by them as representative of mn000z200i
 - copied to /nusoft/data/flux/shared , semi-haphazard file naming and directory structures (some slight modification from source)
- Converted files from flugg “h10” or g4minerva “nudata” format to common “dk2nu” format
 - initially 100 files, but $> 8\text{GeV}$ needs more statistics, so 500
 - files located in /nusoft/data/flux/dk2nu x
 - converted using setup
 - source /nusoft/app/external/setup
 - setup dk2nu v01_00_00 -q e5:debug # ROOT v5.34.18a
- Histogrammed flux, weighted for the various locations with fine binning
- Overlaid fluxes, rebinned coarser for ratio



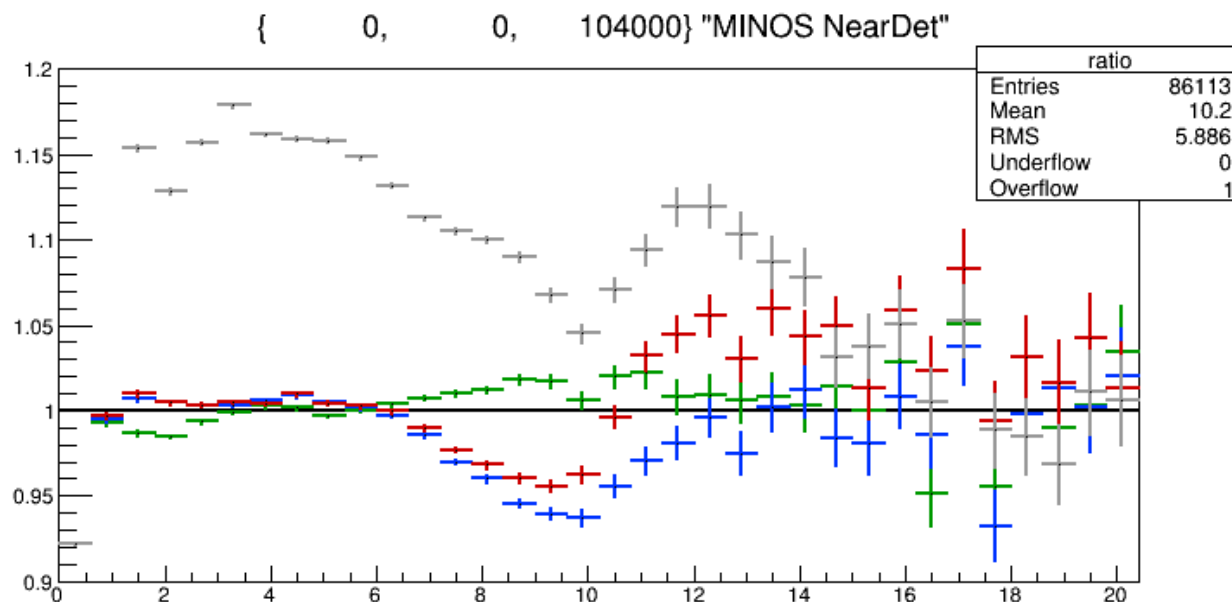
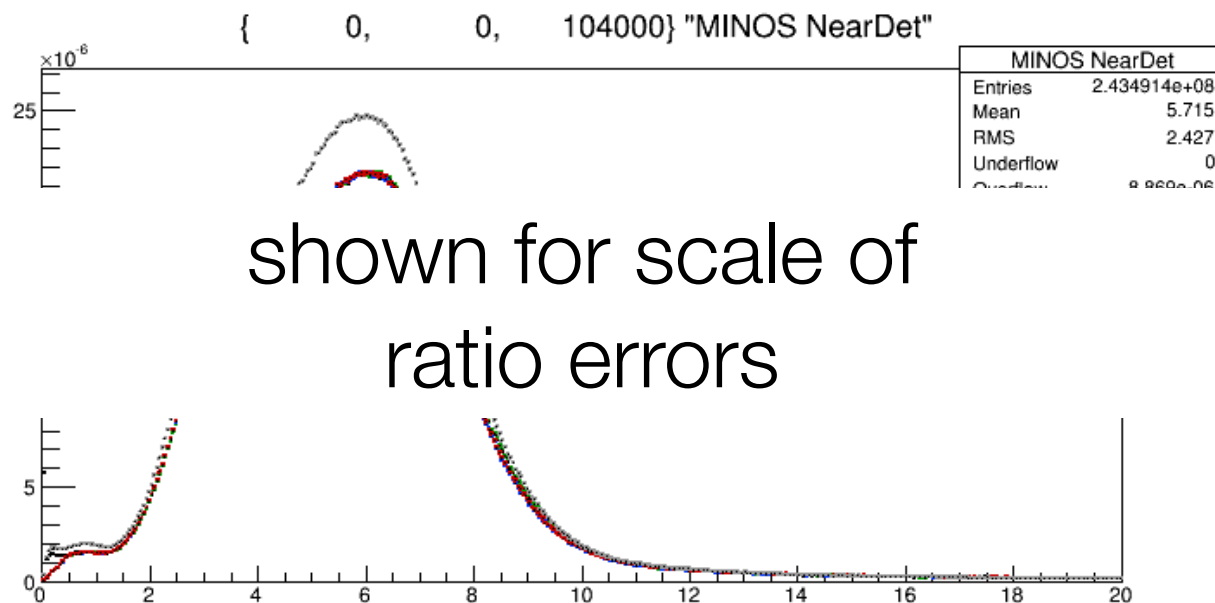
Available mn000z200i

- Files in subdirectories under temporary structure
 - /nusoft/data/flux/dk2nu/<expt>
- 10 classes of NOvA-target forward horn current:
 - nova_2010_flugg...: Luke's files
 - minos_flugg_fluka2008_2013.11.15: + horn2 pos correction
 - minos IIRQ3C: + 3 corrections
 - target moved
 - horn current distribution
 - horn current 199kA (misunderstanding about this issue)
 - minos R08APSW: + prevent importance weight = 0 for early interaction upstream of target
 - minos R08APSWv4: + horn 200kA, spot 1.3x1.3->1.1x1.1mm
 - minerva: Geant4.9.2p03 FTFP_BERT v1.0
 - nova: G4.9.6p01a FTFP_BERT, QGSP_BERT, NUBEAM
 - nova_2013_peanut_lowth: fluka 2011.x, flugg 2009_3 G4.9.3p02 gcc3.4.3



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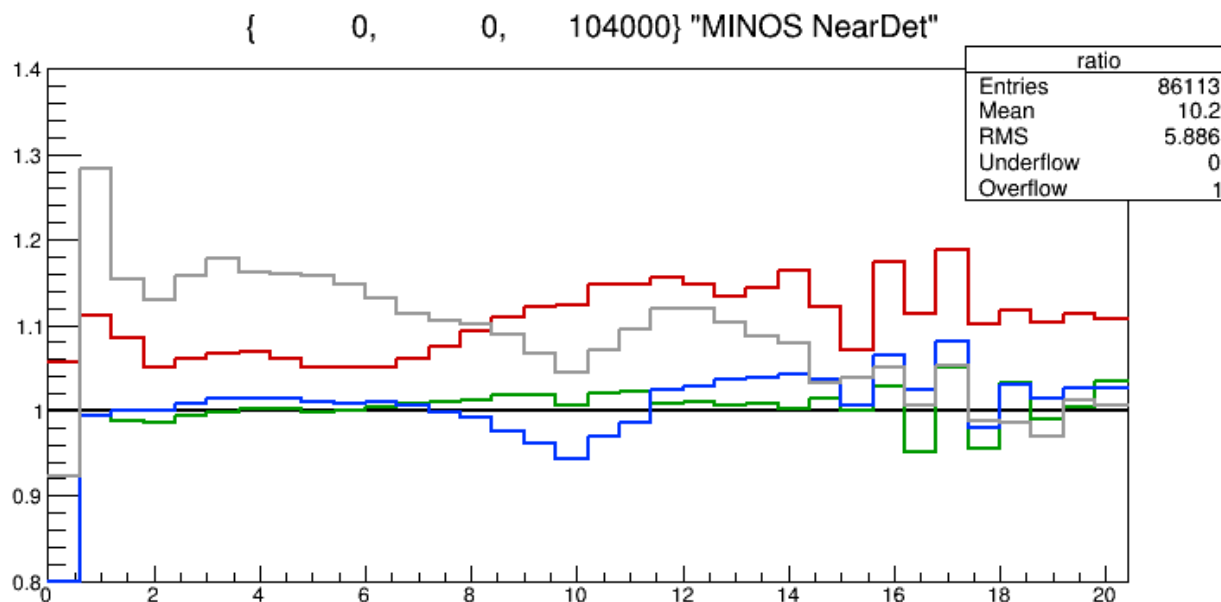
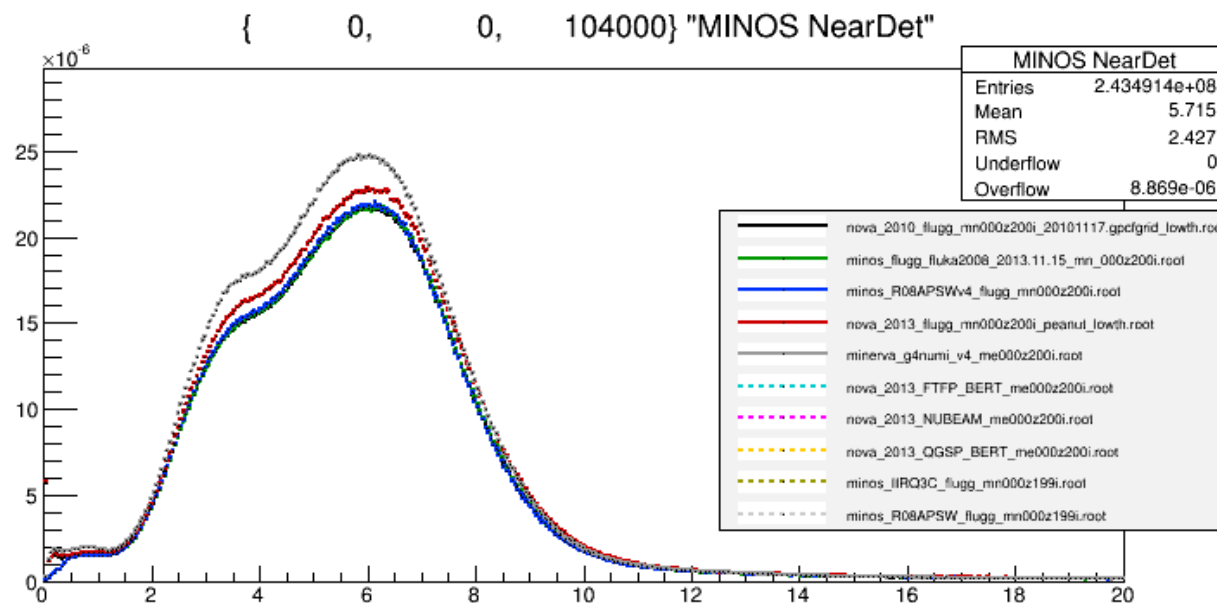
MINOS ND mn000z200i





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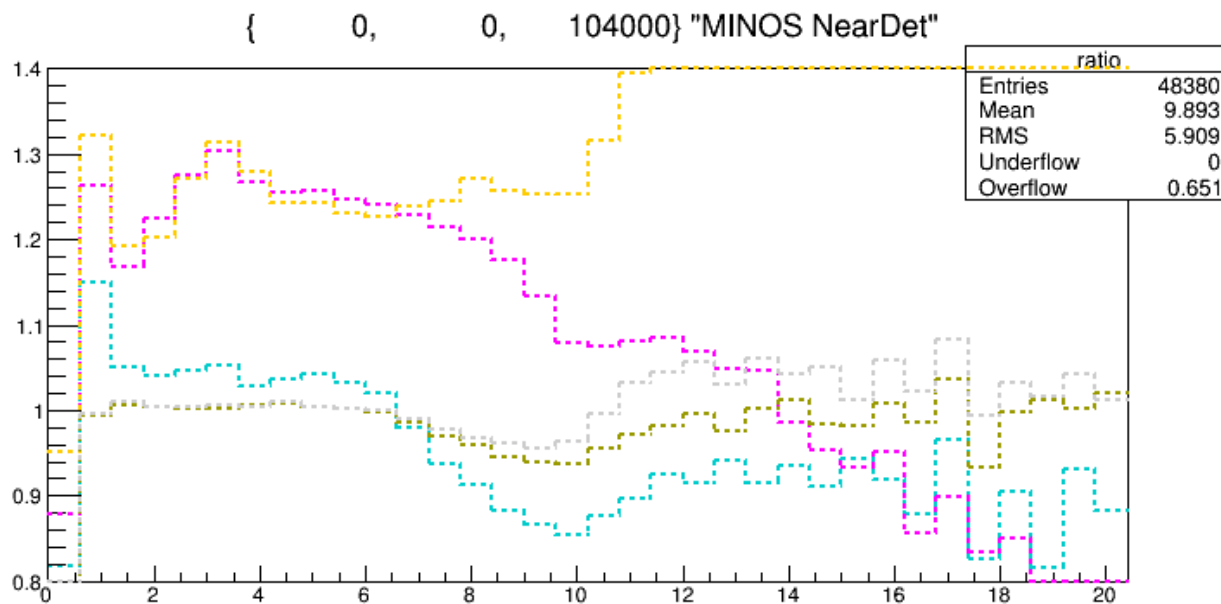
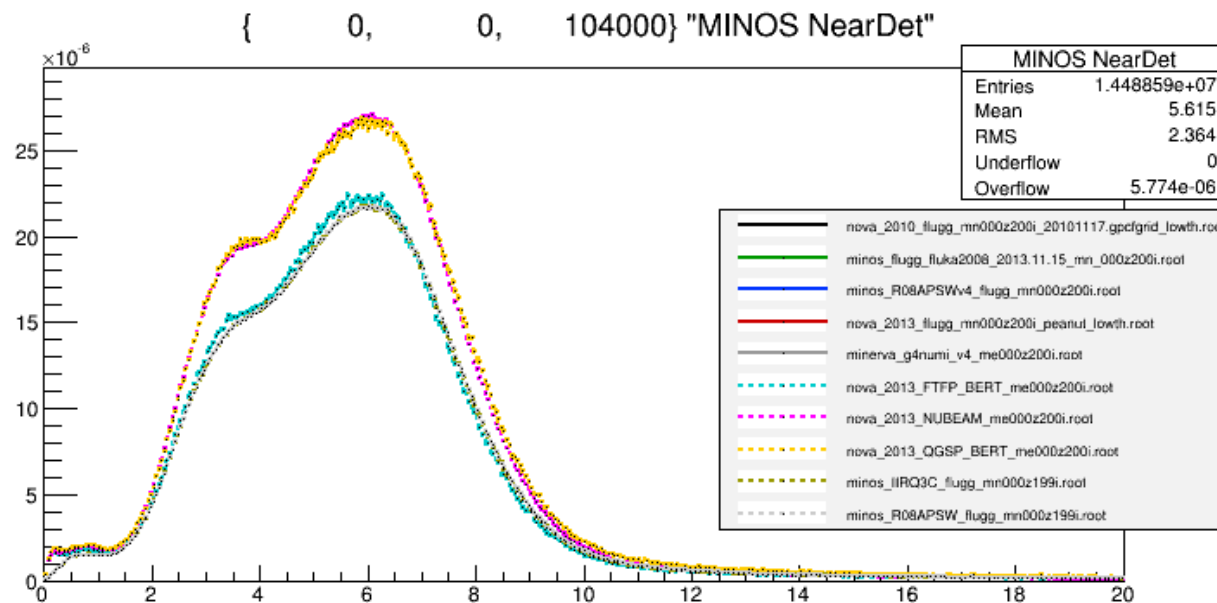
MINOS ND mn000z200i





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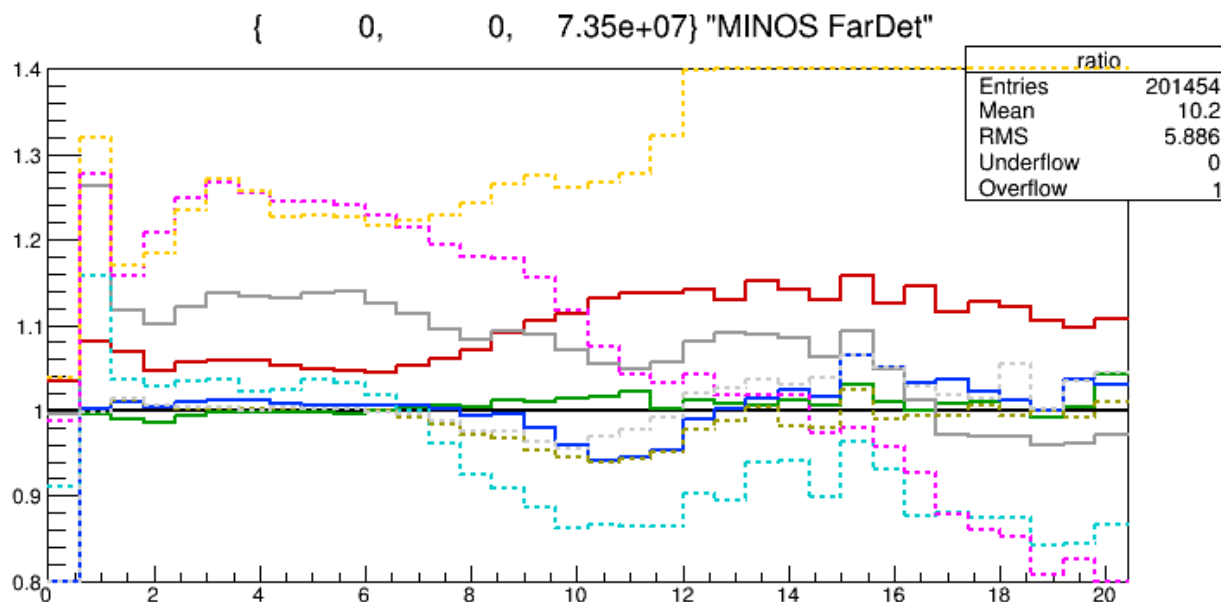
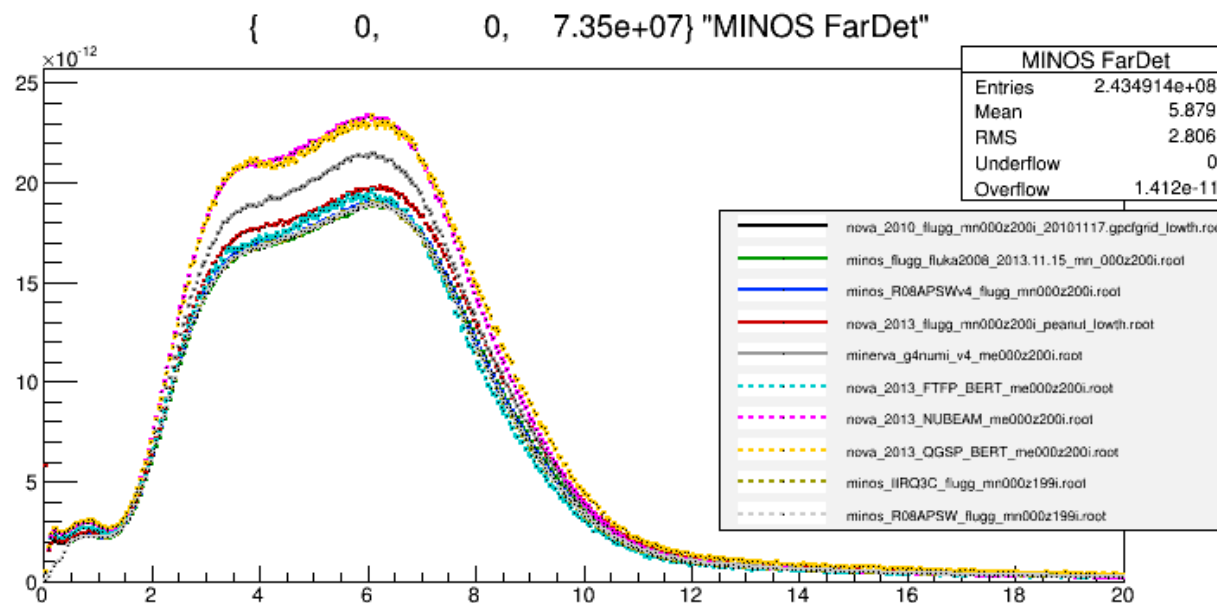
MINOS ND mn000z200i





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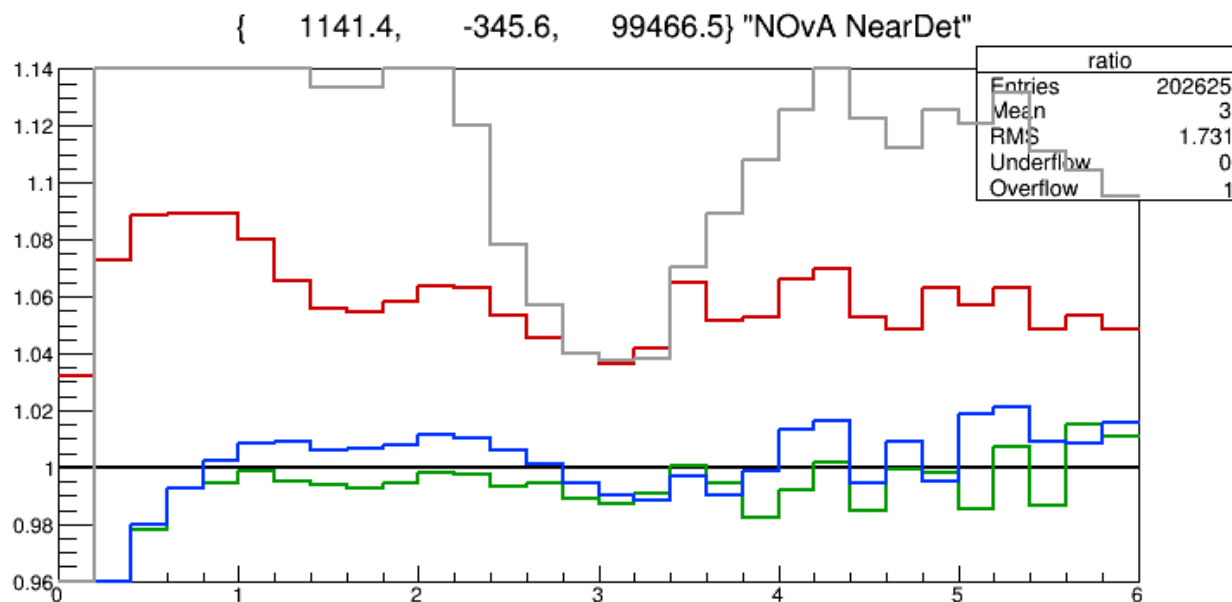
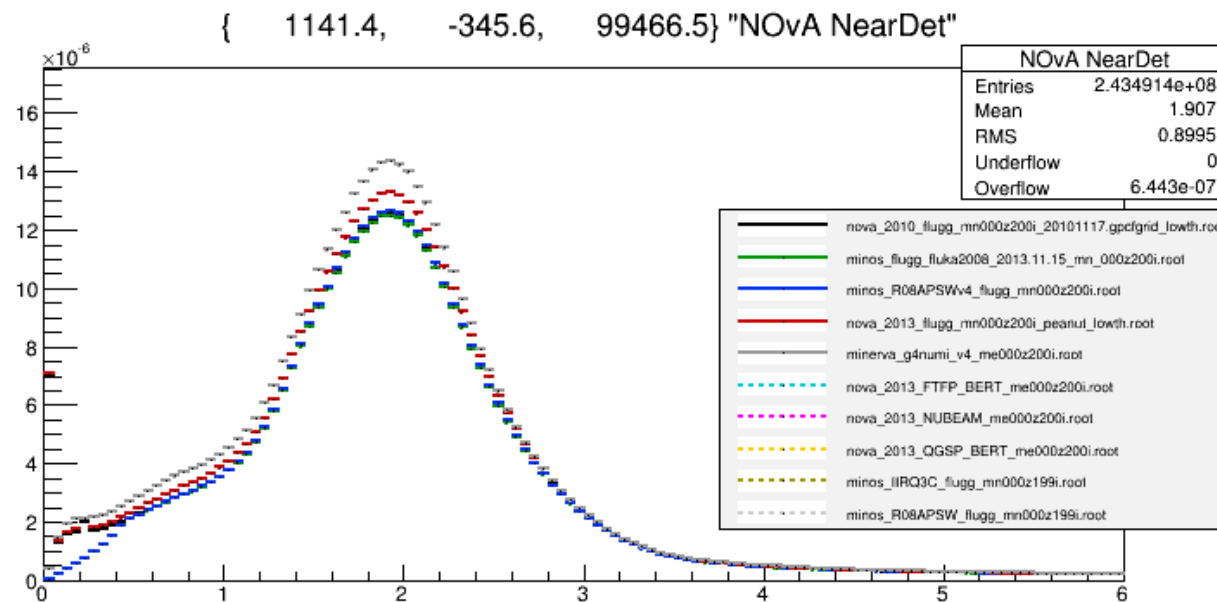
MINOS FD mn000z200i





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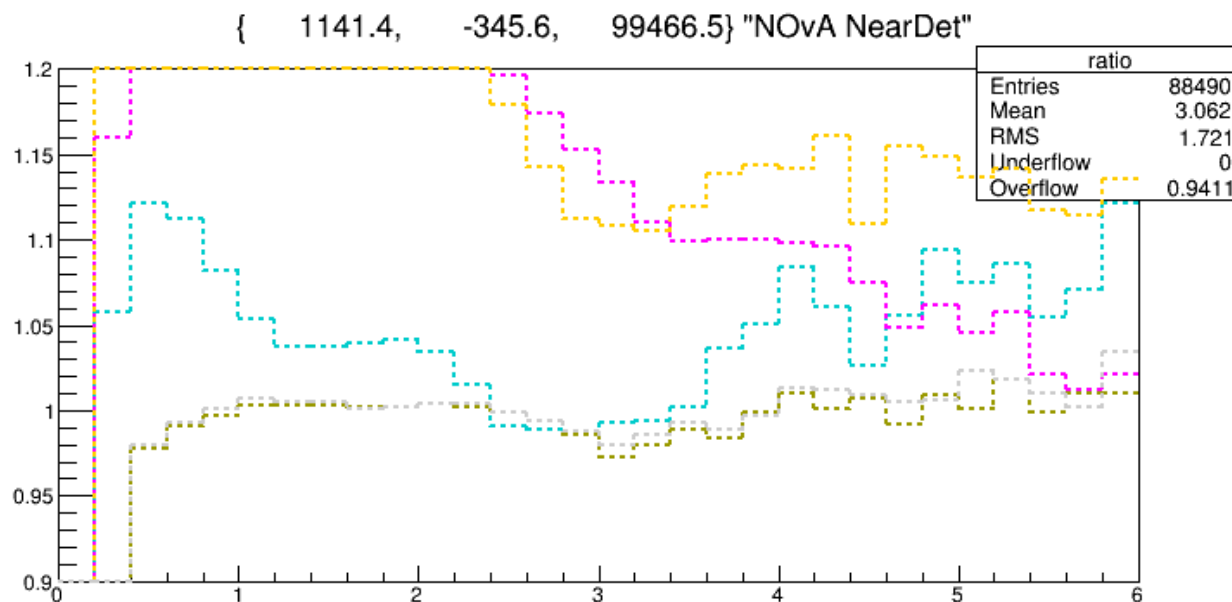
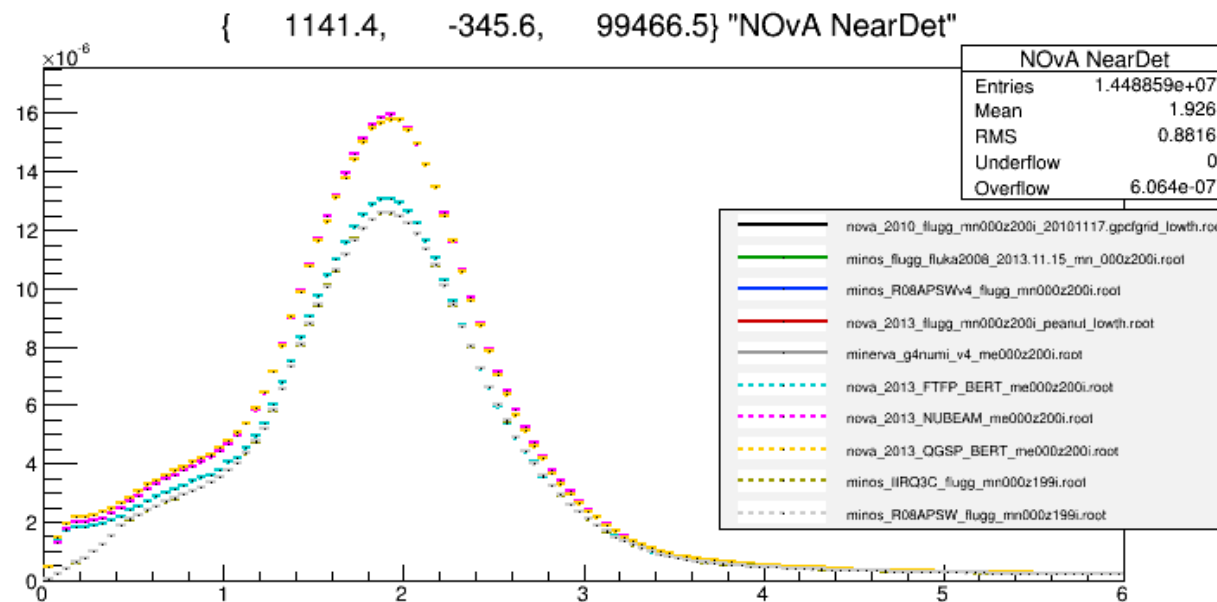
NOvA ND mn000z200i





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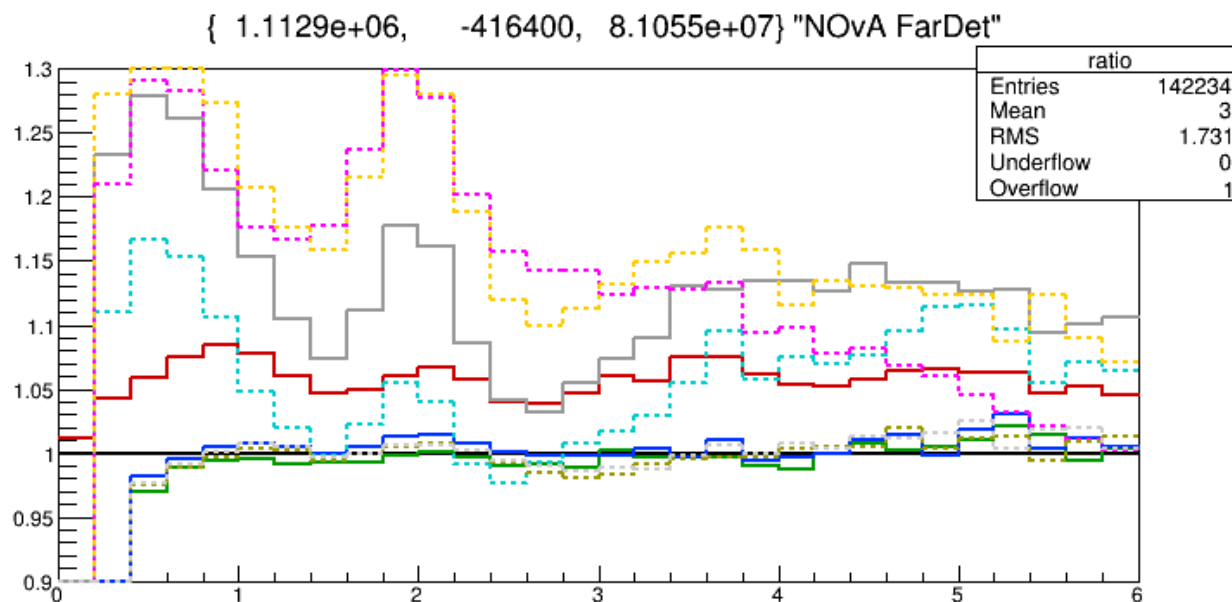
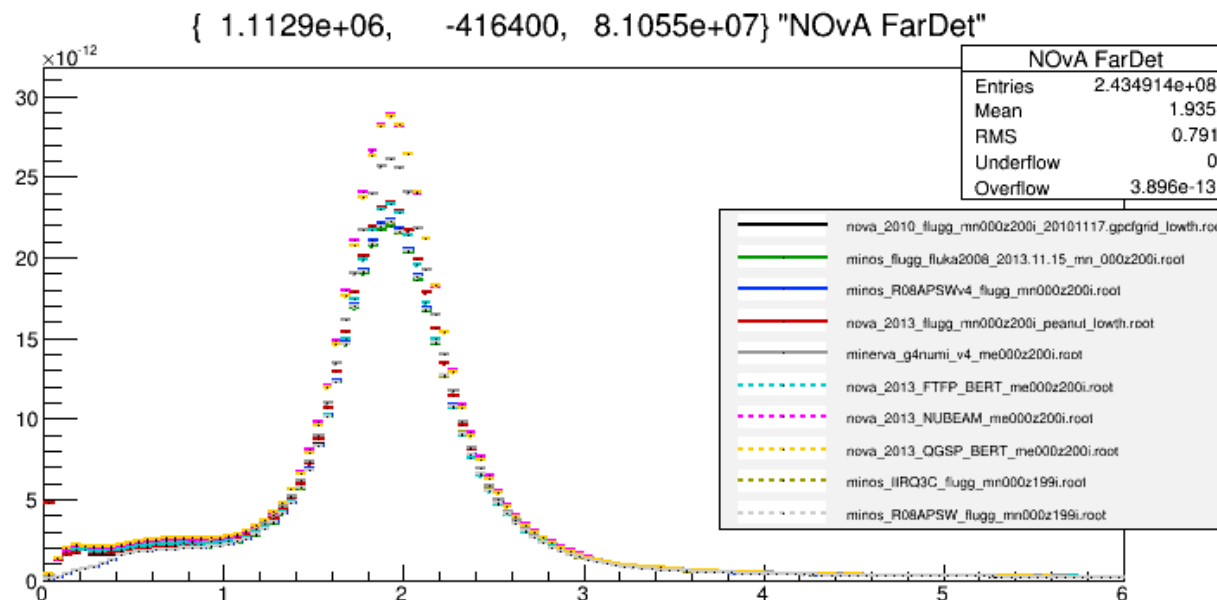
NOvA ND mn000z200i





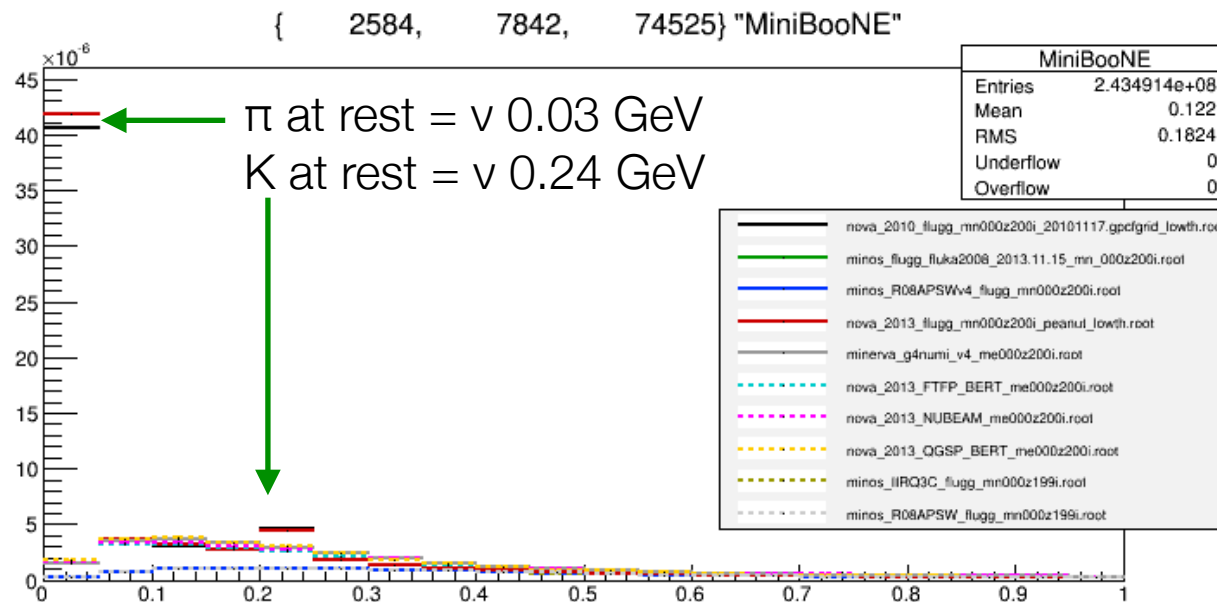
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NOvA FD mn000z200i

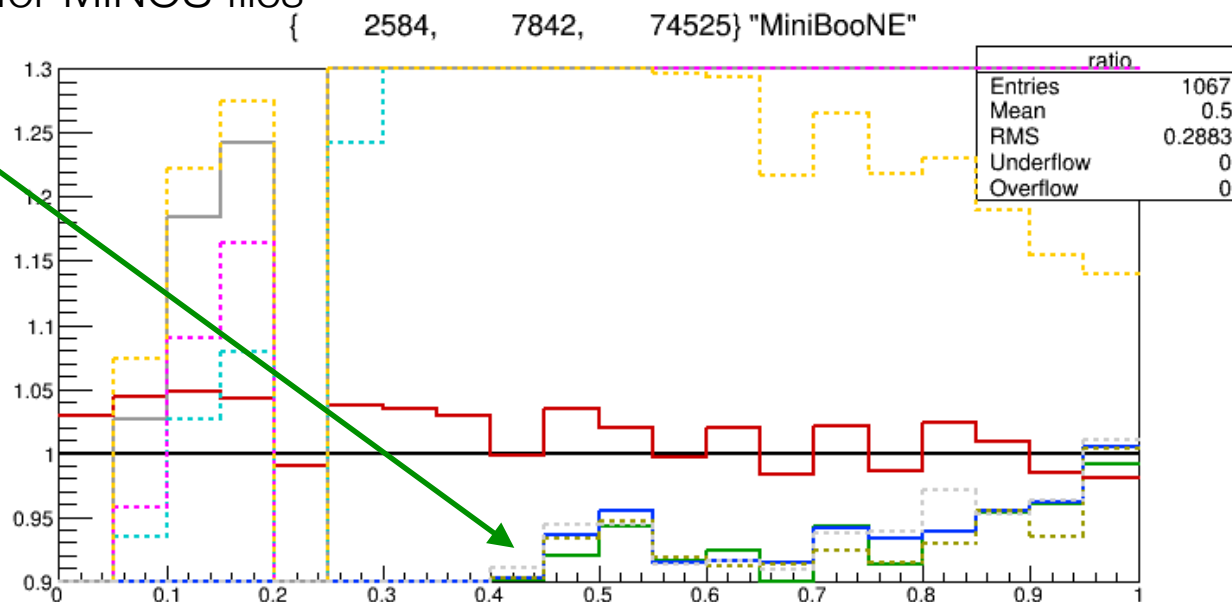


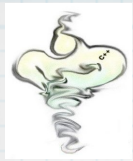
MiniBooNE mn000z200i

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non-"lowth" for MINOS files





Whirlwind of Other Stuff

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- Use of /nusoft/data
 - smallish (+15TB to total of 25TB) increase given, ~10TB used
 - not mounted on grid nodes (though all expts nodes)
 - highly discouraged as primary; PowersThatBe would like us to use dCache (cheaper, more space available, not so bad w/ SLF6)
- Standardize file names and directory structures.
SAM wants unique file names for all time
 - Luke's earlier proposal, refine further for general case (beyond NuMI?)
 - <http://nova-docdb.fnal.gov/cgi-bin/RetrieveFile?docid=7016;filename=FLUGG20120130.pdf>
- Argon and H₂O inside the horns
 - need to check geometry to see how this “air” vol is implemented
 - steal code solutions, with small tweaks, from LBNE?
- Flux File Primer
 - <http://numix-docdb.fnal.gov:8080/cgi-bin/ShowDocument?docid=67>
 - idea is to cover the basics of what's involved w/ flux files: how are they created; how are they used; general ideas about sizes and numbers; etc.
 - evolving document; suggest additions